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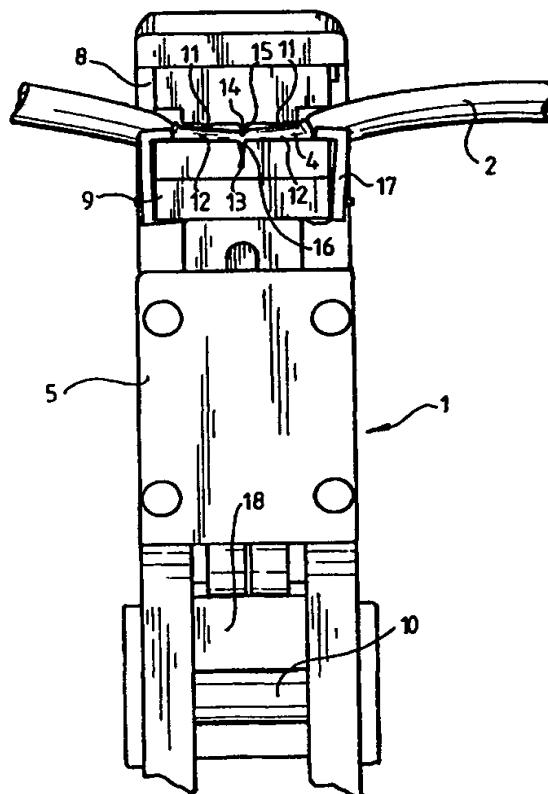
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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|---|--|----|--|
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| (21) International Application Number: <b>PCT/SE99/00878</b>  |  |    | (81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). |
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| (71) Applicant (for all designated States except US): NOVASEP-TUM AB [SE/SE]; Rödjans Väg 7, S-449 34 Nödinge (SE). |  |    |  |
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## (54) Title: SEALING APPLIANCE

## (57) Abstract

An appliance (1) for sealing elastic hoses (2) with a sleeve (4), which is plastically deformable and slipped onto the hose, has two jaws (8, 9) which are movable towards and away from each other. One jaw (8) has two straight bars (11) which project towards the other jaw (9) and extend transversely of the sleeve (4) to make two transverse indentations (12) in the sleeve (4) and the hose (2) when the jaws (8, 9) are moving towards each other. The same jaw (8) has a cutting edge (15) which projects towards the other jaw (9) and is directed transversely of the sleeve (4), the cutting edge making a substantially transverse cutting indication (14) in the sleeve (4) and the hose (2) when the jaws (8, 9) are moving towards each other.



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SEALING APPLIANCETECHNICAL FIELD

The present invention relates to an appliance for mechanical sealing of hollow hoses of elastic material with a sealing means which is made of plastically deformable material and which is applied to the hose, said appliance having two jaws, which are movable towards and away from each other and which, when moving towards each other, crimp the sealing means against the hose to seal the same.

10 BACKGROUND OF THE INVENTION

In a prior-art sealing appliance of the type mentioned by way of introduction, the sealing means in the form of a folded clip is applied to a likewise folded end of the hose. The clip is then crimped against the hose to seal the same, after which the hose is cut downstream of the clip by means of a pair of scissors or some other cutting tool.

As the relevant hoses have a relatively small diameter, say 5-10 mm, the clips are also relatively small and often difficult to apply in the right position on the folded end of the hose. Nor is it infrequent that the clip falls off the end of the hose, before the sealing appliance has managed to grip it for crimping against the hose with the ensuing risk of sealing not taking place.

25 The sealing appliance according to the invention is primarily to be used in the type of device which is intended for introduction and/or withdrawal of a medium in a container and which is disclosed and described in WO 97/16715. More specifically, it is intended for contamination-free sealing and cutting of the hoses which extend between the conveying means and the collecting vessels which are connected to the process container, so that the collecting vessels after being filled with a medium from the process container can be moved without any

risk of contamination to a laboratory or the like for sampling or analysis of the medium.

In the above use of the sealing appliance, which requires good hygienic conditions and contamination-free environment/surroundings, clips of the mentioned type are unacceptable. One reason for this is that they are difficult to handle and often do not provide the desired sealing. Another reason is that there is in most cases at least a small portion of the hose left downstream of the clip containing a small quantity of the medium which leaks out to the surrounding area with an obvious risk of contamination.

#### OBJECT OF THE INVENTION

The main object of the present invention is to provide a sealing appliance of the type mentioned by way of introduction, satisfying all the requirements for contamination-free transport of the relevant collecting vessels, which are filled with a medium, to the laboratory or the like.

#### SUMMARY OF THE INVENTION

This as well as related objects are achieved in a simple and efficient manner in that the sealing means has the form of a sleeve which is slipped on to the hose, that at least one of the jaws has at least one bar which projects towards the other jaw and which, when the jaws are moving towards each other, makes an indentation in the sleeve and the hose to reinforce the sealing thereof as well as the fixing of the sleeve on the hose, and that at least one of the jaws has a cutting means, which projects towards the other jaw and which, when the jaws are moving towards each other, makes a cutting indication in the sleeve and the hose to allow a sealing cutting of the hose.

In a particularly preferred embodiment there are at least two straight bars which are arranged substantially in parallel at a distance from each other and extend substantially transversely of the longitudinal direction of

the sleeve to make a corresponding number of substantially transverse indentations in the sleeve and the hose, the cutting means preferably extending substantially transversely of the longitudinal direction of the 5 sleeve and making a substantially transverse cutting indication in the sleeve and the hose.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described below in more detail with reference to the accompanying drawings, in which

10 Fig. 1 is a perspective view, seen obliquely from above, of an appliance according to a currently particularly preferred embodiment of the invention in an initial position for the sealing of a hose,

15 Fig. 2 is a front view of a part of the appliance according to Fig. 1 in the initial position,

Fig. 3 is a perspective view of the appliance corresponding to Fig. 1 in end position of the sealing,

Fig. 4 is a view corresponding to Fig. 2, the appliance being in the end position, and

20 Figs 5A and 5B are side views which show the sealed hose, partially cut open, in a position after sealing and in a position after completed cutting of the hose.

DESCRIPTION OF A PREFERRED EMBODIMENT

As mentioned above, the appliance generally designated 1 is primarily conceived for use in the type of device which is intended for introduction and/or withdrawal of a medium in a container and which is disclosed and described in WO 97/16715. More specifically, it is intended for sealing and cutting the hoses in a mechanical and 25 contamination-free manner, which extend between the conveying means and the collecting vessels which are connected to the process container, so that the collecting vessels after being filled with a medium from the process container can be transported without any risk of contamination 30 to a laboratory or the like for sampling or analysis of the medium.

Still, the appliance 1 can, of course, also be used in a number of other applications where good hygienic conditions and/or contamination-free surroundings and/or working environment are required to a varying extent.

5 Thus the appliance 1 is generally intended for mechanical sealing of hollow hoses 2 of elastic material, e.g. rubber or plastic, of a quality which is suitable for the purpose. The sealing is carried out with the aid of a sealing means 3, which is made of a plastically deformable material, e.g. plastic or metal, having suitable plastic properties and which is applied to the hose 2. In the preferred embodiment shown, the sealing means 3 consists of a metal sleeve 4 which has been slipped on to the hose 2 in advance. The sleeve has a length of preferably two or more multiples of the diameter of the hose 2, which in turn is typically in the range of 5-10 mm.

20 As shown in Figs 1 and 3, the appliance 1 itself can have the form of a pair of tongs 5 which is hand-operated and which has one fixed and one movable leg 6 and 7 and two jaws 8 and 9 which are movable towards and away from each other. When moving the jaws 8, 9 towards each other by manually pressing the legs 6, 7 together and using a driving means 10, which will be described below, the 25 sleeve 4 is crimped against the hose 2, thereby sealing the same.

30 More specifically, as best seen in Fig. 2, at least one of the jaws 8 or 9, in this case the jaw 8, has at least one bar 11 which projects towards the other jaw 9 or 8, in this case the jaw 9. In the above-described movement of the jaws 8, 9 towards each other, this bar 11 makes a marked indentation 12, see Figs 4, 5A and 5B, in the sleeve 4 and in the hose 2. In the preferred embodiment, there are two such bars 11, which are placed substantially in parallel at a distance from each other and extend substantially transversely of the longitudinal direction of the sleeve 4. The bars 11 are preferably

straight and make two substantially transverse indentations 12 in the sleeve 4 and in the hose 2 to reinforce the sealing thereof as well as the fixing of the sleeve 4 on the hose 2. If desired and if suitable, there may, of course, be more than two such bars 11 or bars which are differently placed/formed on said jaw 8.

Moreover, at least one of the jaws 8 or 9, also in this case the jaw 8, has a cutting means 13 projecting towards the other jaw 9 or 8 (see Figs 2 and 4). When the jaws 8, 9 are moving towards each other in the described manner, this cutting means 13 makes a cutting indication 14 in the sleeve 4 and in the hose 2 to allow the sleeve and the hose to be cut in a sealing manner.

In the shown embodiment, the cutting means 13 is preferably formed as a substantially straight cutting edge 15. The cutting edge extends substantially transversely of the longitudinal direction of the sleeve 4 and thus makes a substantially transverse cutting indication 14 in the sleeve 4 and in the hose 2. As seen in Figs 2 and 4, the cutting edge 15 projects to greater extent than the bars 11 and suitably co-operates with an opposite, straight recess 16 in the opposite jaw, in this case the jaw 9. The depth, width and form of the recess 16 can vary, and the recess is suitably adapted to the form of the cutting edge 15 and to the qualities of the material of the hose 2 and the sleeve 4. In certain applications, the recess 16 can, if required or desired, be omitted.

Preferably, the cutting edge 15 is situated substantially halfway between the bars 11, if they are two in number, such as shown in Figs 2 and 4. If there are further bars 11, the cutting edge 15 is suitably placed halfway between two adjacent bars, preferably the ones situated closest to the middle. In a certain application, it is, of course, also possible to place the cutting edge 15 outside or on one side of the bar or the bars 11.

The cutting indication 14 mentioned above is preferably such that the sleeve 4 and the hose 2 are not cut or broken directly when sealing by means of the appliance 1, such as shown in Fig. 5A, but at an optional 5 point of time after that. Then the sleeve 4 and the hose 2 are separated along the cutting indication 14 by manual or mechanical bending back and forth, until the sleeve is divided by fatigue fracture, as shown in Fig. 5B.

Naturally, nothing prevents the sleeve 4 and the 10 hose 2 from being separated along the cutting indication 14 directly in connection with the actual sealing.

To fix the sleeve 4 and the hose 2 in the intended position between the jaws 8 and 9 in the appliance 1 when sealing, at least one of the jaws 8 or 9, in this case 15 the jaw 9, has a fixture 17. The fixture fixes and supports the hose 2 and the sleeve 4 laterally, horizontally and vertically and can be formed in an optional manner which is not described in further detail.

For practical and other reasons, in the disclosed 20 and described embodiment the bars 11 and the cutting edge 15 are arranged on one of the jaws 8 or 9, in this case the jaw 8, and the fixture 17 on the other, opposite jaw 9 or 8, in this case the jaw 9. The bars 11, the cutting edge 15 and the fixture 17 can be mounted on the associated 25 jaw 8, 9 with the aid of suitable attachment means, which are not shown. Alternatively, one/some of or all these components can be made in one piece with the associated jaw. In the shown case, the bars 11 and the cutting edge 15 are made in one piece with the associated 30 jaw, whereas the fixture 17 is mounted on the associated jaw, see Figs 2 and 4.

In the preferred embodiment, the jaw 8 provided with the bars 11 and the cutting edge 15 suitably has the form of a die which is fixedly mounted in the appliance 1 with 35 the aid of attachment means (not shown), see Figs 2 and 4. In a corresponding manner, the jaw 9 provided with the fixture 17 has the form of a punch. This punch is mounted

in a slidable manner (not shown) in the appliance 1 and is actuatable by the previously mentioned driving means 10. The driving means 10 suitably consists of a gear generally designated 18, which can be an eccentric mechanism 5 or the like and which is suitably connected to and actuatable by means of the movable leg 7 of the pair of tongs 5.

The invention is not, of course, limited to the embodiment which is described above and shown in the drawings, and can be modified in many different ways within 10 the scope of protection according to the appended claims.

The appliance 1 does not, for example, need to be a manually operable pair of tongs, but it can alternatively be a separate tool or a tool which is included in a 15 machine and driven electrically, pneumatically, hydraulically etc according to need and desire. The jaws 8, 9 with the associated components (bars 11, cutting edge 15 and fixture 17) can be attached to the appliance 1 in a replaceable manner and match the size of the hose 2 and 20 the sleeve 4 and/or be mutually exchangeable etc.

## CLAIMS

1. An appliance for mechanical sealing of hollow  
5 hoses (2) of elastic material with a sealing means (3)  
which is made of plastically deformable material and  
which is applied to the hose, said appliance (1) having  
two jaws (8, 9), which are movable towards and away from  
each other and which, when moving towards each other,  
10 crimp the sealing means (3) against the hose (2) to seal  
the same, characterised in that the sealing  
means (3) has the form of a sleeve (4) which is slipped  
on to the hose (2), that at least one of the jaws (8 or  
9) has at least one bar (11) which projects towards the  
15 other jaw (9 or 8) and which, when the jaws (8, 9) are  
moving towards each other, makes an indentation (12) in  
the sleeve (4) and the hose (2) to reinforce the sealing  
thereof as well as the fixing of the sleeve on the hose,  
and that at least one of the jaws (8 or 9) has a cutting  
20 means (13), which projects towards the other jaw (9 or 8)  
and which, when the jaws (8, 9) are moving towards each  
other, makes a cutting indication (14) in the sleeve (4)  
and the hose (2) to allow a sealing cutting of the hose  
(2).

25 2. An appliance according to claim 1, characterised in that there are at least two straight  
bars (11) which are arranged substantially in parallel  
at a distance from each other and extend substantially  
transversely of the longitudinal direction of the sleeve  
30 (4) to make a corresponding number of substantially  
transverse indentations (12) in the sleeve (4) and the  
hose (2), and that the cutting means (13) extends sub-  
stantially transversely of the longitudinal direction of  
the sleeve (4) and makes a substantially transverse cut-  
35 ting indication (14) in the sleeve (4) and the hose (2).

3. An appliance according to claim 1 or 2, characterised in that the cutting means (13) has the

form of a substantially straight cutting edge (15), which projects to a greater extent than the bar/bars (11).

4. An appliance according to claim 3, characterised in that the cutting edge (15) co-operates 5 with an opposite recess (16) in the other jaw (9 or 8).

5. An appliance according to claim 3 or 4, characterised in that the cutting edge (15) is situated substantially half-way between two adjacent bars (11).

6. An appliance according to claim 3 or 4, 10 characterised in that the cutting edge (15) is situated on one side of the bar/bars (11).

7. An appliance according to any one of the preceding claims, characterised in that at least 15 one of the jaws (8 or 9) has a fixture (17) to position the sleeve (4) and the hose (2) between the jaws (8, 9).

8. An appliance according to any one of the preceding claims, characterised in that the bar/bars (11) and the cutting edge (15) are situated on one jaw (8), and that the fixture (17) is situated on the 20 other jaw (9), the bar/bars, the cutting edge and the fixture being mounted on or being made in one piece with the associated jaw.

9. An appliance according to claim 8, characterised in that the jaw (8) provided with the 25 bar/bars (11) and the cutting edge (15) has the form of a die, which is fixedly mounted in the appliance (1), and that the jaw (9) provided with the fixture (17) has the form of a punch, which is movably arranged in the appliance (1) and actuatable by a driving means (10).

30 10. An appliance according to claim 9, characterised in that it has the form of a pair of tongs (5) which is hand-operated and has one fixed and one movable leg (6, 7), the movable leg (7) actuating the jaw (9) forming the punch by means of a gear device, 35 preferably an eccentric mechanism or the like, forming the driving means (10).

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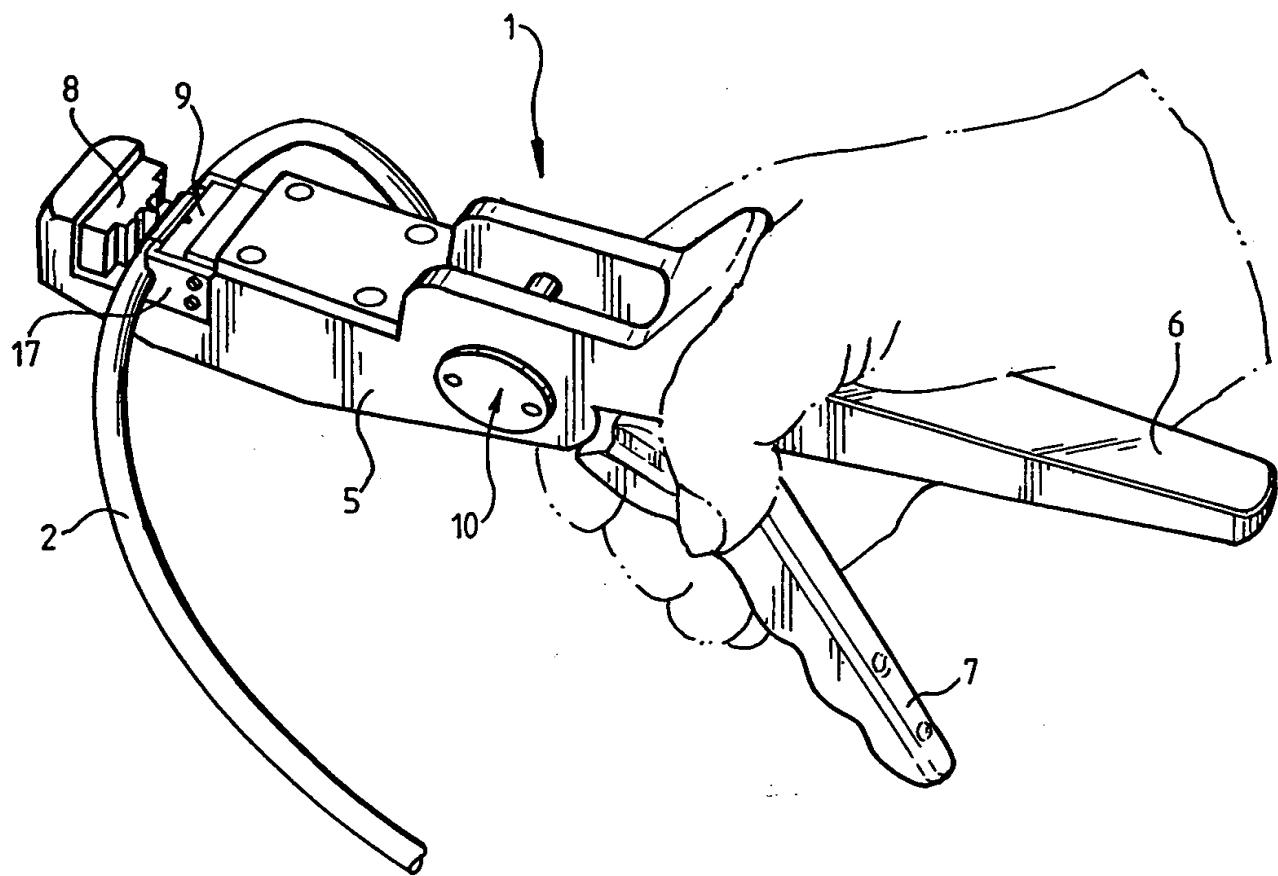


Fig. 1

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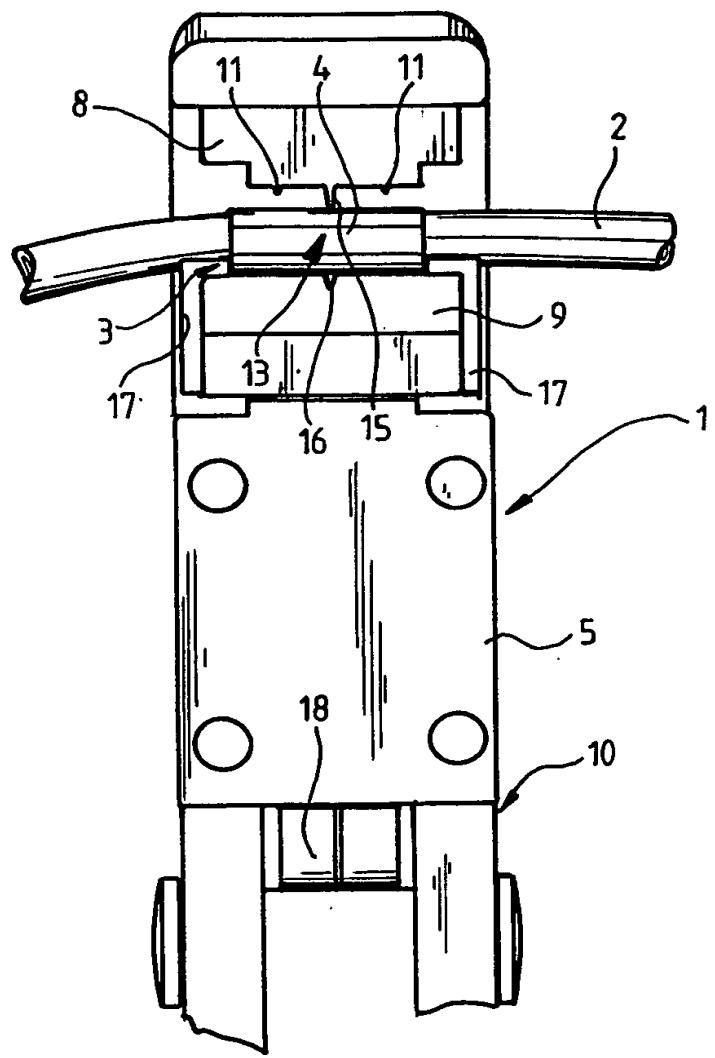


Fig. 2

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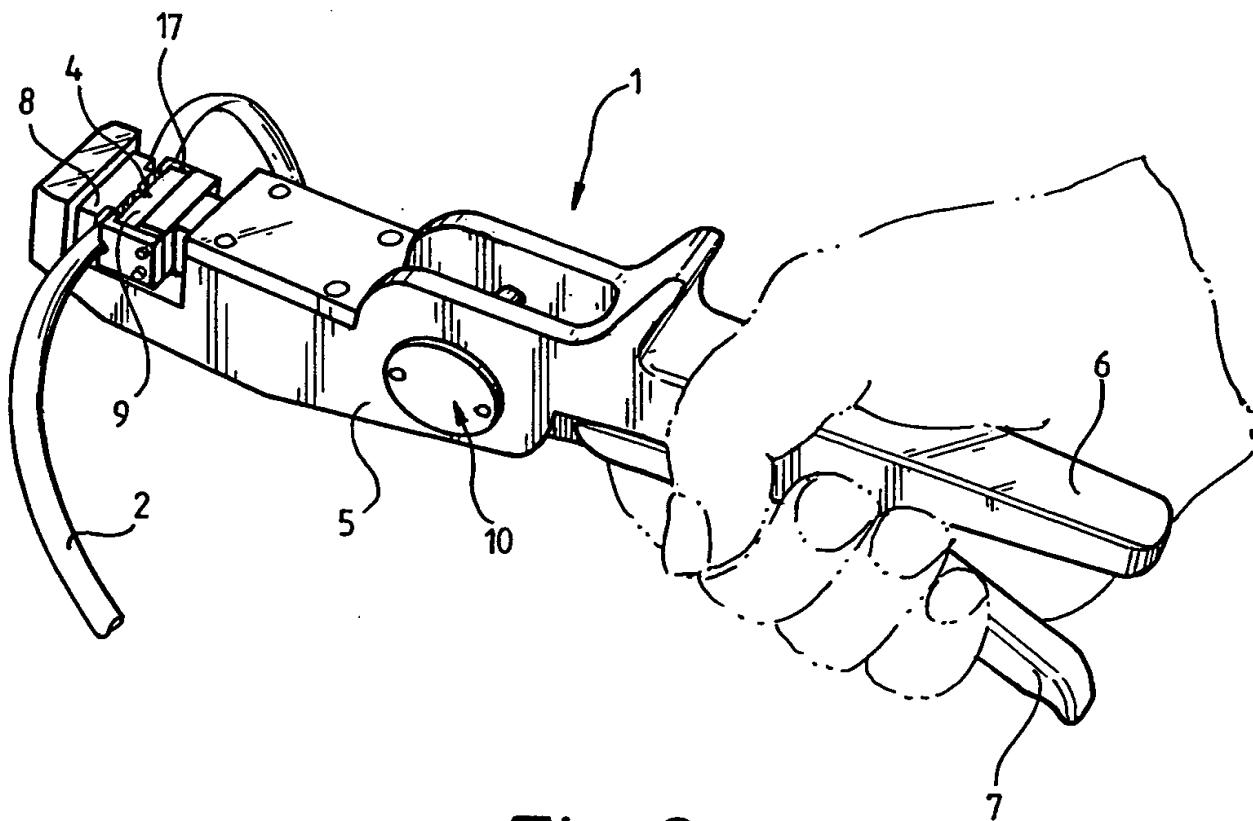


Fig. 3

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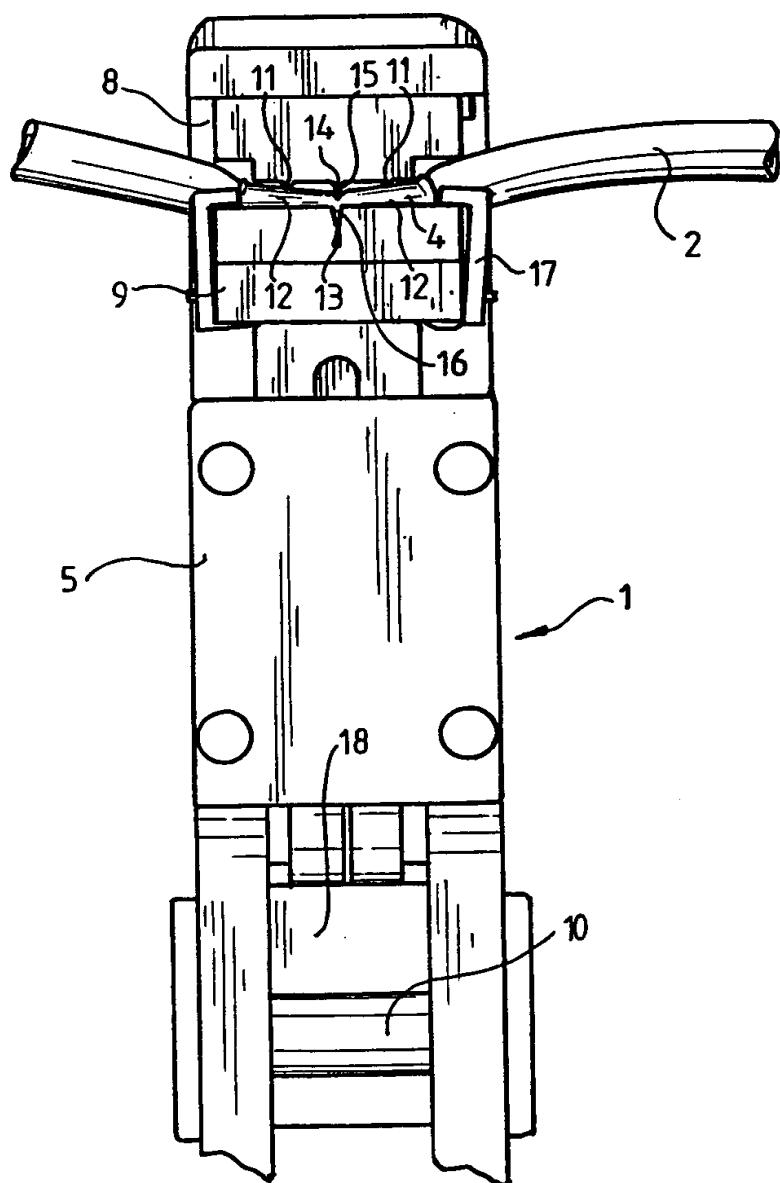


Fig. 4

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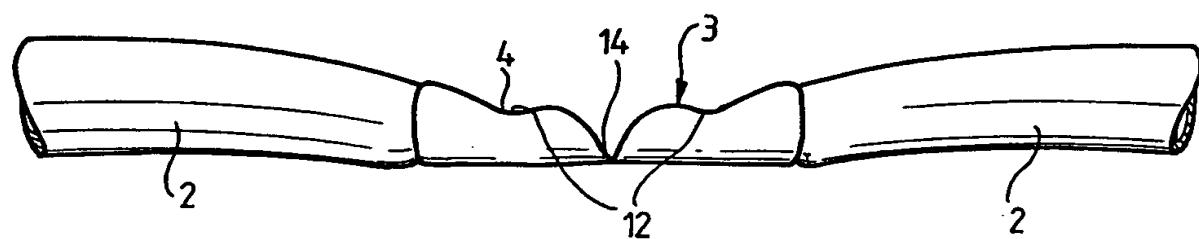


Fig. 5A

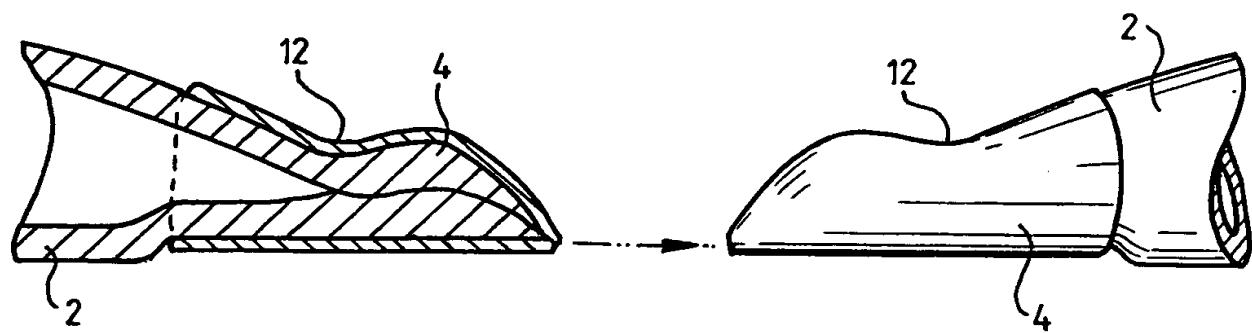


Fig. 5B

## INTERNATIONAL SEARCH REPORT

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| International application No.<br>PCT/SE 99/00878 |
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## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G01N 1/18, B29C 57/10

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## B. FIELDS SEARCHED

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IPC6: H01M, B29C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                      | Relevant to claim No. |
|-----------|---|-----------------------|
| A         | EP 0508474 A2 (DENCO, INC.), 14 October 1992<br>(14.10.92), column 1, line 37 - column 2, line 15<br>-- | 1-10                  |
| A         | WO 9716715 A1 (NOVASEPTUM AB), 9 May 1997<br>(09.05.97), page 10, line 6 - line 31<br>-----             | 1-10                  |

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**INTERNATIONAL SEARCH REPORT**  
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| Patent document cited in search report | Publication date | Patent family member(s)  | Publication date   |
|--|------------------|--|--|
| EP 0508474 A2                          | 14/10/92         | CA 2061610 A<br>CA 2063616 A<br>EP 0508373 A<br>JP 5116221 A<br>MX 9201522 A<br>MX 9201523 A<br>US 5156701 A<br>US 5209800 A<br>US 5244522 A<br>US 5279685 A<br>US 5397425 A<br>US 5525186 A<br>JP 6197957 A | 11/10/92<br>11/10/92<br>14/10/92<br>14/05/93<br>01/10/92<br>01/10/92<br>20/10/92<br>11/05/93<br>14/09/93<br>18/01/94<br>14/03/95<br>11/06/96<br>19/07/94 |
| WO 9716715 A1                          | 09/05/97         | AU 7511096 A<br>BR 9611148 A<br>CN 1201523 A<br>EP 0858589 A<br>NO 981977 A<br>SE 507448 C<br>SE 9503870 A   | 22/05/97<br>30/03/99<br>09/12/98<br>19/08/98<br>30/04/98<br>08/06/98<br>03/05/97   |

## INTERNATIONAL SEARCH REPORT

International application No.  
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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| Patent document cited in search report | Publication date | Patent family member(s)  | Publication date   |
|--|------------------|--|--|
| EP 0508474 A2                          | 14/10/92         | CA 2061610 A<br>CA 2063616 A<br>EP 0508373 A<br>JP 5116221 A<br>MX 9201522 A<br>MX 9201523 A<br>US 5156701 A<br>US 5209800 A<br>US 5244522 A<br>US 5279685 A<br>US 5397425 A<br>US 5525186 A<br>JP 6197957 A | 11/10/92<br>11/10/92<br>14/10/92<br>14/05/93<br>01/10/92<br>01/10/92<br>20/10/92<br>11/05/93<br>14/09/93<br>18/01/94<br>14/03/95<br>11/06/96<br>19/07/94 |
| WO 9716715 A1                          | 09/05/97         | AU 7511096 A<br>BR 9611148 A<br>CN 1201523 A<br>EP 0858589 A<br>NO 981977 A<br>SE 507448 C<br>SE 9503870 A   | 22/05/97<br>30/03/99<br>09/12/98<br>19/08/98<br>30/04/98<br>08/06/98<br>03/05/97   |

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

|  |  |   |
|--|--|---|
| Applicant's or agent's file reference<br>2996165   | FOR FURTHER ACTION                                       | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
| International application No.<br>PCT/SE99/00878  | International filing date (day/month/year)<br>25.05.1999 | Priority date (day/month/year)<br>28.05.1998  |
| International Patent Classification (IPC) or national classification and IPC7<br>G01N 1/18, B29C 57/10 |  |   |
| Applicant<br>NOVASEPTUM AB et al   |  |   |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I  Basis of the report
- II  Priority
- III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV  Lack of unity of invention
- V  Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement
- VI  Certain documents cited
- VII  Certain defects in the international application
- VIII  Certain observations on the international application

|  |  |
|--|--|
| Date of submission of the demand<br>07.10.1999   | Date of completion of this report<br>26.09.2000                      |
| Name and mailing address of the IPEA/SE<br>Patent- och registreringsverket<br>Box 5055<br>S-102 42 STOCKHOLM<br>Facsimile No. 08-667 72 88 | Authorized officer<br>Ulla Granlund/MP<br>Telephone No. 08-782 25 00 |

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

International application No.

PCT/SE99/00878

**I. Basis of the report**

1. This report has been drawn on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

 the international application as originally filed. the description, pages \_\_\_\_\_, as originally filed,  
pages \_\_\_\_\_, filed with the demand.  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_ the claims, Nos. \_\_\_\_\_, as originally filed,  
Nos. \_\_\_\_\_, as amended under Article 19,  
Nos. \_\_\_\_\_, filed with the demand,  
Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_  
Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_ the drawings, sheets/fig \_\_\_\_\_, as originally filed,  
sheets/fig \_\_\_\_\_, filed with the demand  
sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_  
sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_

2. The amendments have resulted in the cancellation of:

 the description, pages \_\_\_\_\_ the claims, Nos. \_\_\_\_\_ the drawings, sheets/fig \_\_\_\_\_

3.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/00878

## V. Resoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

|                               |        |       |     |
|-------------------------------|--------|-------|-----|
| Novelty (N)                   | Claims | 1-10  | YES |
|                               | Claims | _____ | NO  |
| Inventive step (IS)           | Claims | 1-10  | YES |
|                               | Claims | _____ | NO  |
| Industrial applicability (IA) | Claims | 1-10  | YES |
|                               | Claims | _____ | NO  |

## 2. Citations and explanations

The claimed invention relates to an appliance for sealing elastic hoses with a sealing means, which is plastically deformable and slipped on to the hose. The appliance comprises two jaws which are movable towards and away from each other. The invention is intended to solve problems regarding contamination - free sealing and cutting of hoses.

EP A 0508474, (column 1, line - column 2, line 15), which represents the closest prior art, discloses a device for sealing elastic hoses, comprising two clamping jaws for flattening a tube section. A cutting member is movable for cutting through the flattened tube. The tube ends are melted by a heated wafer.

However, the cited document does not reveal sealing means in the form of a sleeve which is slipped on to the hose.

A bar on the jaw makes an indentation in the sleeve and the hose. Cutting means on the jaws makes a cutting indication in the sleeve and the hose to allow a sealing cutting of the hose.

Therefore, the claimed invention as stated in claims 1-10 is novel. It is further considered to involve an inventive step as the new device makes it possible to seal the hose without leak of medium from the end of the hose. It is also considered to be industrially applicable.

## RECORD COPY

PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty

For receiving Office use only

PCT/ SE 99 / 00878  
International Application No.International Filing Date **25-05-1999**

The International Patent Office

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference **2996165**  
(if desired)(12 characters maximum)

## Box No. I TITLE OF INVENTION

SEALING APPLIANCE

## Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

NOVASEPTUM AB

Rödjans Väg 7

SE-449 34 NÖDINGE

Sweden

 This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality: **SE**State (that is, country) of residence: **SE**

This person is applicant  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

## Box No. III FURTHER APPLICANT(S) AND/OR /FURTHER INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

ÅRTHUN, Nils

Sockenvägen 12

SE-430 90 ÖCKERÖ

Sweden

This person is:

applicant only  
 applicant and inventor  
 inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality: **SE**State (that is, country) of residence: **SE**

This person is applicant  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

 Further applicants and/or (further) inventors are indicated on a continuation sheet

## Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

Telephone No.

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Facsimile No.

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Teleprinter No.

AWAPATENT AB

Box 11394

S-404 28 GÖTEBORG

SWEDEN

Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent

## Box No. V DESIGNATION OF

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

## Regional Patent

AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe and any other State which is a Contracting State of the Harare Protocol and of the PCT

EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT

EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT

OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

## National Patent (if other kind of protection or treatment desired, specify on dotted line):

|   |                                       |  |   |
|---|---------------------------------------|--|---|
| <input checked="" type="checkbox"/> AL        | Albania                               | <input checked="" type="checkbox"/> LS | Lesotho                                   |
| <input checked="" type="checkbox"/> AM        | Armenia                               | <input checked="" type="checkbox"/> LT | Lithuania                                 |
| <input checked="" type="checkbox"/> AT        | Austria                               | <input checked="" type="checkbox"/> LU | Luxembourg                                |
| <input checked="" type="checkbox"/> AU        | Australia                             | <input checked="" type="checkbox"/> LV | Latvia                                    |
| <input checked="" type="checkbox"/> AZ        | Azerbaijan                            | <input checked="" type="checkbox"/> MD | Republic of Moldova                       |
| <input checked="" type="checkbox"/> BA        | Bosnia and Herzegovina                | <input checked="" type="checkbox"/> MG | Madagascar                                |
| <input checked="" type="checkbox"/> BB        | Barbados                              | <input checked="" type="checkbox"/> MK | The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG        | Bulgaria                              | <input checked="" type="checkbox"/> MN | Mongolia                                  |
| <input checked="" type="checkbox"/> BR        | Brazil                                | <input checked="" type="checkbox"/> MW | Malawi                                    |
| <input checked="" type="checkbox"/> BY        | Belarus                               | <input checked="" type="checkbox"/> MX | Mexico                                    |
| <input checked="" type="checkbox"/> CA        | Canada                                | <input checked="" type="checkbox"/> NO | Norway                                    |
| <input checked="" type="checkbox"/> CH and LI | Switzerland and Liechtenstein         | <input checked="" type="checkbox"/> NZ | New Zealand                               |
| <input checked="" type="checkbox"/> CN        | China                                 | <input checked="" type="checkbox"/> PL | Poland                                    |
| <input checked="" type="checkbox"/> CU        | Cuba                                  | <input checked="" type="checkbox"/> PT | Portugal                                  |
| <input checked="" type="checkbox"/> CZ        | Czech Republic                        | <input checked="" type="checkbox"/> RO | Romania                                   |
| <input checked="" type="checkbox"/> DE        | Germany                               | <input checked="" type="checkbox"/> RU | Russian Federation                        |
| <input checked="" type="checkbox"/> DK        | Denmark                               | <input checked="" type="checkbox"/> SD | Sudan                                     |
| <input checked="" type="checkbox"/> EE        | Estonia                               | <input checked="" type="checkbox"/> SE | Sweden                                    |
| <input checked="" type="checkbox"/> ES        | Spain                                 | <input checked="" type="checkbox"/> SG | Singapore                                 |
| <input checked="" type="checkbox"/> FI        | Finland                               | <input checked="" type="checkbox"/> SI | Slovenia                                  |
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| <input checked="" type="checkbox"/> GH        | Ghana                                 | <input checked="" type="checkbox"/> TM | Turkmenistan                              |
| <input checked="" type="checkbox"/> GM        | Gambia                                | <input checked="" type="checkbox"/> TR | Turkey                                    |
| <input checked="" type="checkbox"/> HR        | Croatia                               | <input checked="" type="checkbox"/> TT | Trinidad and Tobago                       |
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| <input checked="" type="checkbox"/> IL        | Israel                                | <input checked="" type="checkbox"/> US | United States of America                  |
| <input checked="" type="checkbox"/> IN        | India                                 | <input checked="" type="checkbox"/> UZ | Uzbekistan                                |
| <input checked="" type="checkbox"/> IS        | Iceland                               | <input checked="" type="checkbox"/> VN | Viet Nam                                  |
| <input checked="" type="checkbox"/> JP        | Japan                                 | <input checked="" type="checkbox"/> YU | Yugoslavia                                |
| <input checked="" type="checkbox"/> KE        | Kenya                                 | <input checked="" type="checkbox"/> ZW | Zimbabwe                                  |
| <input checked="" type="checkbox"/> KG        | Kyrgyzstan                            |  |   |
| <input checked="" type="checkbox"/> KP        | Democratic People's Republic of Korea |  |   |
| <input checked="" type="checkbox"/> KR        | Republic of Korea                     |  |   |
| <input checked="" type="checkbox"/> KZ        | Kazakhstan                            |  |   |
| <input checked="" type="checkbox"/> LC        | Saint Lucia                           | <input checked="" type="checkbox"/> AE | United Arab Emirates                      |
| <input checked="" type="checkbox"/> LK        | Sri Lanka                             | <input checked="" type="checkbox"/> ZA | South Africa                              |
| <input checked="" type="checkbox"/> LR        | Liberia                               |  |   |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

AE United Arab Emirates

ZA South Africa

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

| Box No. VI PRIORITY                                       |                                  | M                                |  |  |
|---|----------------------------------|----------------------------------|--|--|
| Filing date<br>of earlier application<br>(day/month/year) | Number<br>of earlier application | Where earlier application is:    |  |  |
|   |                                  | national application:<br>country | regional application:<br>regional Office | international application:<br>receiving Office |
| item (1)<br>28/05/1998<br>28 May 1998                     | 9801885-6                        | SE                               |  |  |
| item (2)  |                                  |                                  |  |  |
| item (3)  |                                  |                                  |  |  |

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): 1

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

#### Box No. VII INTERNATIONAL SEARCHING AUTHORITY

|  |   |
|--|---|
| Choice of International Searching Authority (ISA)<br>(If two or more International Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):<br><br>ISA/SE | Request to use results of earlier search; reference to that search<br>(if an earlier search has been carried out by or requested from the International Searching Authority): |
|  | Date (day/month/year)      Number      Country (or regional Office)   |

#### Box No. VIII CHECK LIST; LANGUAGE OF FILING

|   |        |  |  |
|---|--------|--|--|
| This international application contains the following number of sheets: |        | This international application is accompanied by the item(s) marked below:                                       |  |
| request   | : 3 ✓  | 1. <input checked="" type="checkbox"/> fee calculation sheet   |  |
| description (excluding sequence listing part)                           | : 7 ✓  | 2. <input checked="" type="checkbox"/> separate signed power of attorney   |  |
| claims  | : 2 ✓  | 3. <input type="checkbox"/> copy of general power of attorney; reference No., if any:                            |  |
| abstract  | : 1 ✓  | 4. <input type="checkbox"/> statement explaining lack of signature   |  |
| drawings  | : 5 ✓  | 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s):                            |  |
| sequence listing part of description                                    | : -    | 6. <input type="checkbox"/> translation of international applications into (language):                           |  |
| Total number of sheets  | : 18 ✓ | 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material |  |
| Figure of the drawings which should accompany the abstract:             | 4      | 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form              |  |
|   |        | 9. <input checked="" type="checkbox"/> other (specify): Copy of Off Action, Subauthorisation                     |  |
|   |        | Language of filing of the international application: <u>Swedish</u>  |  |

#### Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

Göteborg, 21 May 1999

  
Lars Franzén

Authorised Representative, AWAPATENT AB

|  |   |
|--|---|
| For receiving Office use only  |   |
| 1. Date of actual receipt of the<br>Purported international application:   | 2. Drawings:<br><br><input checked="" type="checkbox"/> received:<br><br><input type="checkbox"/> not received: |
| 25 -05- 1999   |   |
| 3. Corrected date of actual receipt due to later but<br>Timely received papers or drawings completing the purported international application: |   |
| 4. Date of timely receipt of the required<br>Corrections under PCT Article 11(2):  |   |
| 5. International Searching Authority<br>(if two or more are competent): ISA/SE   | 6. <input type="checkbox"/> Transmittal of search copy<br>delayed until search fee is paid.                     |

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| 21 JULY 1999   |              |

25 -05- 1999

FÖRSLUTNINGSVERKTYGTEKNISKT OMRÅDE

Föreliggande uppfinning hänför sig till ett verktyg för mekanisk förslutning av ihåliga slangar av elastiskt material med hjälp av ett på slangen anbragt förslutningsdon av plastiskt deformerbart material, vilket verktyg har två i riktning mot och bort från varandra rörliga backar, som vid rörelse mot varandra kontaktpressar förslutningsdonet mot slangen för tätande förslutning därav.

UPPFINNINGENS BAKGRUND

10 Vid ett tidigare känt förslutningsverktyg av det ovan angivna slaget anbringas förslutningsdonet i form av ett dubbeltvikt clips på en likaså dubbeltvikt ände av slangen. Därefter kontaktpressas clipset mot slangen för dess förslutning, varpå slangen kapas nedströms clipset 15 med hjälp av en sax eller annat skärredskap.

Eftersom de här aktuella slangarna har relativt liten diameter, säg 5-10 mm, är clipsen också relativt små och ofta svåra att anbringa i rätt läge på den dubbeltvikta slangänden. Det är heller inte särskilt ovanligt, att 20 clipset ramlar av från slangänden, innan förslutningsverktyget har hunnit greppa det före kontaktpressningen mot slangen med därav följande risk för utebliven förslutning.

Förslutningsverktyget enligt uppfinningen är i första hand avsett att användas vid den typ av anordning för införande och/eller uttagande av medium i en behållare, som visas och beskrivs i WO 97/16715. Närmare bestämt för kontaminationsfri förslutning och kapning av de slangar, som sträcker sig mellan de till processbehållaren anslutna överföringsorganen och uppsamlingskärlen, så att de sistnämnda efter att ha fyllts med medium från processbehållaren kan utan kontaminationsrisk förflyttas till ett laboratorium eller liknande för provtagning eller analys av mediet.

25 -05- 1999

Vid den ovan beskrivna tillämpningen av förslutningsverktyget med stora krav på hygien och kontaminationsfri omgivning/miljö är clips av det angivna slaget oacceptabla. Ett skäl är att de är svårhanterliga och ofta inte åstadkommer önskad förslutning. Ett annat skäl är att det nästan alltid finns åtminstone en liten bit slang kvar nedströms clipset, som innehåller en liten mängd medium och läcker ut detta medium till omgivningen med därav följande, uppenbar risk för kontaminering.

10 UPPFINNINGENS ÄNDAMÅL

Huvudändamålet med föreiggande uppfinding är att anvisa ett förslutningsverktyg av den inledningsvis angivna typen, där alla krav på kontaminationsfri förflytning av de aktuella, med medium fyllda uppsamlingskärlen till laboratoriet eller liknande tillgodoses.

SAMMANFATTNING AV UPPFINNINGEN

Detta och andra relaterade ändamål uppnås på ett enkelt och effektivt sätt genom att förslutningsdonet har formen av en på slangen trädd hylsa, att åtminstone en av backarna har minst en mot den andra backen utskjutande bom, som vid backarnas rörelse mot varandra åstadkommer en intryckning i hylsan och slangen för att förstärka såväl den tätande förslutningen därav som fixeringen av hylsan på slangen, och att åtminstone en av backarna har ett mot den andra backen utskjutande kapdon, vilket vid backarnas rörelse mot varandra åstadkommer en kapanvisning i hylsan och slangen för att medge tätande kapning av slangen.

Vid en speciellt föredragen utföringsform finns det minst två huvudsakligen parallellt på avstånd från varandra placerade och väsentligen tvärs mot hylsans längdriktning sig sträckande, raka bommar för åstadkommande av motsvarande antal väsentligen tvärgående intryckningar i hylsan och slangen, varvid kapdonet företrädesvis sträcker sig huvudsakligen tvärs mot hylsans längdriktning och

åstadkommer en väsentligen tvärgående kapanvisning i hylsan och slangen.

KORT BESKRIVNING AV RITNINGARNA

Uppfinningen beskrivs närmare i det följande med 5 hänvisning till de bifogade ritningarna. På dessa visar:

Fig.1 i en vy i perspektiv snett framifrån/uppifrån ett verktyg enligt en för närvarande speciellt föredragen utföringsform av uppfinitionen i ett utgångsläge för förslutning av en slang,

10 Fig.2 en del av verktyget enligt Fig.1 i en vy framifrån i utgångsläget,

Fig.3 i en mot Fig.1 svarande perspektivvy verktyget i ett slutläge vid förslutningen,

15 Fig.4 en vy motsvarande Fig.2 med verktyget i slutläget, och

Fig.5A och 5B den förslutna slangen i en sidovy och delvis uppskuren i ett läge efter förslutningen och ett läge efter fullbordad kapning av slangen.

BESKRIVNING AV FÖREDRAGEN UTFÖRINGSFORM

20 Det på ritningarna generellt med 1 betecknade verktyget är, som nämnts tidigare, i första hand framtaget för användning vid den typ av anordning för införande och/eller uttagande av medium i en behållare, som visas och beskrivs i WO 97/16715. Närmare bestämt för att på 25 mekanisk väg kontaminationsfritt försluta och kapa de slangar, som sträcker sig mellan de till processbehållaren anslutna överföringsorganen och uppsamlingskärlen, så att de sistnämnda efter att ha fyllts med medium från processbehållaren kan utan kontaminationsrisk förflyttas 30 till ett laboratorium eller liknande för provtagning eller analys av mediet.

35 Verktyget 1 kan dock givetvis även användas i en mängd andra tillämpningar med mer eller mindre stora krav på hygien och/eller kontaminationsfri omgivning och/eller arbetsmiljö.

Således är verktyget 1 generellt avsett för mekanisk förslutning av ihåliga slangar 2 av elastiskt material, exempelvis gummi eller plast av för ändamålet lämplig kvalitet. Denna förslutning sker med hjälp av ett på 5 slangen 2 anbragt förslutningsdon 3 av plastiskt deformbart material, exempelvis plast eller metall med lämpliga plastiska egenskaper. Vid den visade, föredragna utföringsformen utgörs förslutningsdonet 3 av en på slangen 2 i förväg trädd metallhylsa 4. Denna har en längd som 10 företrädesvis uppgår till två eller flera multiplar av slangens 2 diameter, vilken i sin tur typiskt ligger i intervallet 5-10 mm.

Själva verktyget 1 kan, såsom visas i Fig.1 och 3, ha formen av en handmanövreradstång 5 med en fast och en 15 rörlig skänkel 6 och 7 och med två i riktning mot och bort från varandra rörliga backar 8 och 9. Vid rörelse av dessa backar 8, 9 mot varandra genom manuell hoptryckning av skänklarna 6, 7 och via ett längre fram beskrivet drivdon 10 kontaktpressas hylsan 4 mot slangen 2 för den 20 tätande förslutningen därav.

Närmare bestämt har, som bäst framgår av Fig.2, åtminstone den ena av backarna 8 eller 9, här backen 8, minst en mot den andra backen 9 eller 8, här backen 9, 25 utskjutande bom 11. Vid backarnas 8, 9 ovan beskrivna rörelse mot varandra åstadkommer denna bom 11 en markerad intryckning 12, se Fig.4, 5A och 5B, i hylsan 4 och i slangen 2. Vid den föredragna utföringsformen finns det två sådana huvudsakligen parallellt på avstånd från varandra placerade och väsentligen tvärs mot hylsans 4 längdriktning sig sträckande bommar 11. Dessa bommar 11 30 är företrädesvis raka och åstadkommer två väsentligen tvärgående intryckningar 12 i hylsan 4 och i slangen 2 för att förstärka såväl den tätande förslutningen därav som fixeringen av hylsan 4 på slangen 2. Om så önskas och 35 är lämpligt kan det naturligtvis finnas fler än två så-

dana eller på annat sätt placerade/utformade bommar 11 på nämnda back 8.

Vidare har åtminstone en av backarna 8 eller 9, även här backen 8, ett mot den andra backen 9 eller 8 utskjutande kapdon 13, se Fig.2 och 4. Vid rörelsen av backarna 8, 9 mot varandra på beskrivet sätt åstadkommer detta kapdon 13 en kapanvisning 14 i hylsan 4 och i slangen 2 för att medge tätande kapning av hylsan och slangen.

Kapdonet 13 är vid den visade utföringsformen företrädesvis utformat som en väsentligen rak egg 15. Denna sträcker sig huvudsakligen tvärs mot hylsans 4 längdriktning och åstadkommer därmed en väsentligen tvärgående kapanvisning 14 i hylsan 4 och i slangen 2. Eggen 15 har, som framgår av Fig.2 och 4, större utstick än bommarna 11 och samverkar lämpligen med ett motbeläget, rakt urtag 16 i den motsatta backen, här backen 9. Urtagets 16 djup, bredd och form i övrigt kan variera och är lämpligen anpassat till eggens 15 form och till materialegenskaperna hos slangen 2 och hylsan 4. I vissa tillämpningar kan, om så krävs eller önskas, urtaget 16 utelämnas.

Företrädesvis befinner sig eggan 15 väsentligen mittemellan bommarna 11, om de är två till antalet, såsom visas i Fig.2 och 4. Finns det fler bommar 11 än så, är eggan 15 lämpligen placerad mittemellan två närliggande bommor, företrädesvis de närmast mitten belägna. Det är naturligtvis också möjligt att i en viss tillämpning placera eggan 15 utanför eller på den ena sidan om bommen eller bommarna 11.

Den ovan angivna kapanvisningen 14 är företrädesvis sådan, att hylsan 4 och slangen 2 inte kapas eller går av direkt vid förslutningen med hjälp av verktyget 1, såsom visas i Fig.5A, utan vid en valfri tidpunkt därefter. Då separeras hylsan 4 och slangen 2 vid kapanvisningen 14 genom manuell eller mekanisk bockning fram och åter, tills hylsan delas genom utmattningsbrott, såsom visas i Fig.5B.

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Naturligtvis är det dock ingenting som hindrar, att hylsan 4 och slangen 2 separeras i kapanvisningen 14 direkt i samband med själva förslutningen.

För att fixera hylsan 4 och slangen 2 i avsett läge 5 mellan backarna 8 och 9 i verktyget 1 vid förslutningen, har åtminstone den ena backen 8 eller 9, här backen 9, en fixtur 17. Denna fixerar och stödjer slangen 2 och hylsan 4 i sid-, djup- och höjdled och kan vara utformad på valfritt, inte närmare beskrivet sätt.

10 Av praktiska och andra skäl finns vid den visade och beskrivna utföringsformen bommarna 11 och eggen 15 på den ena backen 8 eller 9, här backen 8, och fixturen 17 på den andra, motbelägna backen 9 eller 8, här backen 9. Bommarna 11, eggen 15 och fixturen 17 kan vara monterade 15 på tillhörande back 8, 9 medelst lämpliga, inte visade fästdon. Alternativt kan någon/några av eller alla dessa komponenter vara gjorda i ett stycke med tillhörande back. I det visade fallet är bommarna 11 och eggen 15 gjorda i ett stycke med sin back, medan fixturen 17 är 20 monterad på sin, se Fig.2 och 4.

Den med bommarna 11 och eggen 15 försedda backen 8 har vid den föredragna utföringsformen lämpligen formen av en i verktyget 1 medelst inte visade fästdon fast monterad dyna, se Fig.2 och 4. På motsvarande sätt har den 25 med fixturen 17 försedda backen 9 formen av en stämpel. Denna stämpel är på inte närmare visat sätt glidrörligt lagrad i verktyget 1 och är påverkbar med det tidigare nämnda drivdonet 10. Drivdonet 10 utgörs lämpligen av en generellt med 18 betecknad utväxlingsanordning, som kan 30 vara en excentermekanism eller liknande och är lämpligt ansluten till och påverkbar med tångens 5 rörliga skänkel 7.

Uppfinningen får naturligtvis inte anses begränsad till den ovan beskrivna och på ritningarna visade utföringsformen, utan kan modifieras på många olika sätt inom 35

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ramen för det i de efterföljande patentkraven begärda patentskyddet.

Exempelvis behöver verktyget 1 inte vara en manuellt manövrerbar tång utan kan alternativt vara ett separat 5 eller i en maskin ingående redskap, som drivs elektriskt, pneumatiskt, hydrauliskt etc alltefter behov och önskan. Backarna 8, 9 med tillhörande komponenter (bommar 11, egg 15 och fixtur 17) kan vara utbytbart fästa i verktyget 1 i anpassning till storleken på slangen 2 och hylsan 4 10 och/eller vara inbördes växlingsbara, etc.

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PATENTKRAV

1. Verktyg för mekanisk förslutning av ihåliga slangar (2) av elastiskt material med hjälp av ett på slangen anbragt förslutningsdon (3) av plastiskt deformbart material, vilket verktyg (1) har två i riktning mot och bort från varandra rörliga backar (8, 9), som vid rörelse mot varandra kontaktpressar förslutningsdonet (3) mot slangen (2) för tätande förslutning därav, kännetecknadt av att förslutningsdonet (3) har formen av en på slangen (2) trädd hylsa (4), av att åtminstone en av backarna (8 eller 9) har minst en mot den andra backen (9 eller 8) utskjutande bom (11), som vid backarnas (8, 9) rörelse mot varandra åstadkommer en intryckning (12) i hylsan (4) och slangen (2) för att förstärka såväl den tätande förslutningen därav som fixeringen av hylsan på slangen, och av att åtminstone en av backarna (8 eller 9) har ett mot den andra backen (9 eller 8) utskjutande kapdon (13), vilket vid backarnas (8, 9) rörelse mot varandra åstadkommer en kapanvisning (14) i hylsan (4) och slangen (2) för att medge tätande kapning av slangen (2).

2. Verktyg enligt krav 1, kännetecknadt av att det finns minst två huvudsakligen parallellt på avstånd från varandra placerade och väsentligen tvärs mot hylsans (4) längdriktning sig sträckande, raka bommar (11) för åstadkommande av motsvarande antal väsentligen tvärgående intryckningar (12) i hylsan (4) och slangen (2), och av att kapdonet (13) sträcker sig huvudsakligen tvärs mot hylsans (4) längdriktning och åstadkommer en väsentligen tvärgående kapanvisning (14) i hylsan (4) och slangen (2).

3. Verktyg enligt krav 1 eller 2, kännetecknadt av att kapdonet (13) har formen av en väsentligen rak egg (15), som har ett större utstick än bommen/bommarna (11).

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4. Verktyg enligt krav 3, kännetecknat  
av att eggen (15) samverkar med ett motbeläget urtag (16)  
i den andra backen (9 eller 8).

5 5. Verktyg enligt krav 3 eller 4, kännetecknat  
av att eggen (15) befinner sig väsentligen mitt-  
emellan två närliggande bommar (11).

6. Verktyg enligt krav 3 eller 4, kännetecknat  
av att eggen (15) befinner sig på den ena sidan om  
10 bommen/bommarna (11).

7. Verktyg enligt något av föregående krav,  
kännetecknat av att åtminstone en av backarna  
(8 eller 9) har en fixtur (17) för lägesfixering av hyls-  
an (4) och slangen (2) mellan backarna (8, 9).

15 8. Verktyg enligt något av föregående krav,  
kännetecknat av att bommen/bommarna (11) och  
eggen (15) finns på den ena backen (8) och av att fixturen  
(17) finns på den andra backen (9), varvid bommen/bom-  
marna, eggen och fixturen är monterade på eller är gjorda  
20 i ett stycke med tillhörande back.

9. Verktyg enligt krav 8, kännetecknat  
av att den med bommen/bommarna (11) och eggen (15) för-  
sedda backen (8) har formen av en i verktyget (1) fast  
monterad dyna och av att den med fixturen (17) försedda  
25 backen (9) har formen av en stämpel, som är rörligt an-  
bragt i verktyget (1) och är påverkbart med ett drivdon  
(10).

10. Verktyg enligt krav 9, kännetecknat  
av att det har formen av en handmanövreradstång (5) med  
30 en fast och en rörlig skänkel (6, 7), varvid den rörliga  
skänkeln (7) via en drivdonet (10) bildande utväxlingsan-  
ordning, företrädesvis en excentermekanism eller liknan-  
de, påverkar den stämpeln bildande backen (9).

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SAMMANDRAG

Ett verktyg (1) för förslutning av elastiska slangar (2) med hjälp av en på slangen trädd, plastiskt deformeras 5 bar hylsa (4) har två i riktning mot och bort från varandra rörliga backar (8, 9). Den ena backen (8) har två mot den andra backen (9) utskjutande och tvärs mot hylsan (4) sig sträckande, raka bommar (11) för åstadkommande av två tvärgående intryckningar (12) i hylsan (4) och slangen 10 (2) vid backarnas (8, 9) rörelse mot varandra. Samma back (8) har en mot den andra backen (9) utskjutande och tvärs mot hylsan (4) riktad egg (15), vilken vid backarnas (8, 9) rörelse mot varandra åstadkommer en väsentligen tvärgående kapanvisning (14) i hylsan (4) och slangen (2).

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Fig. 4

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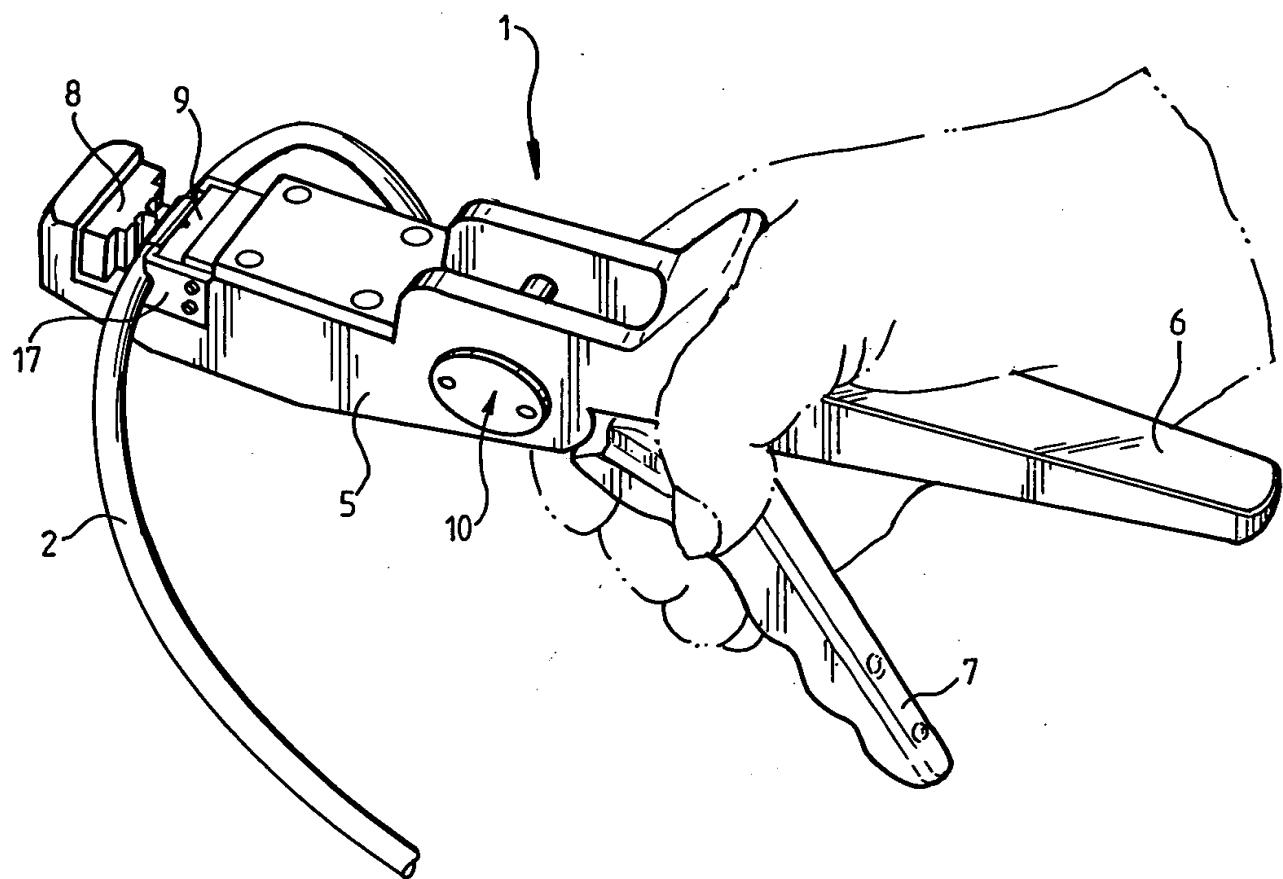


Fig. 1

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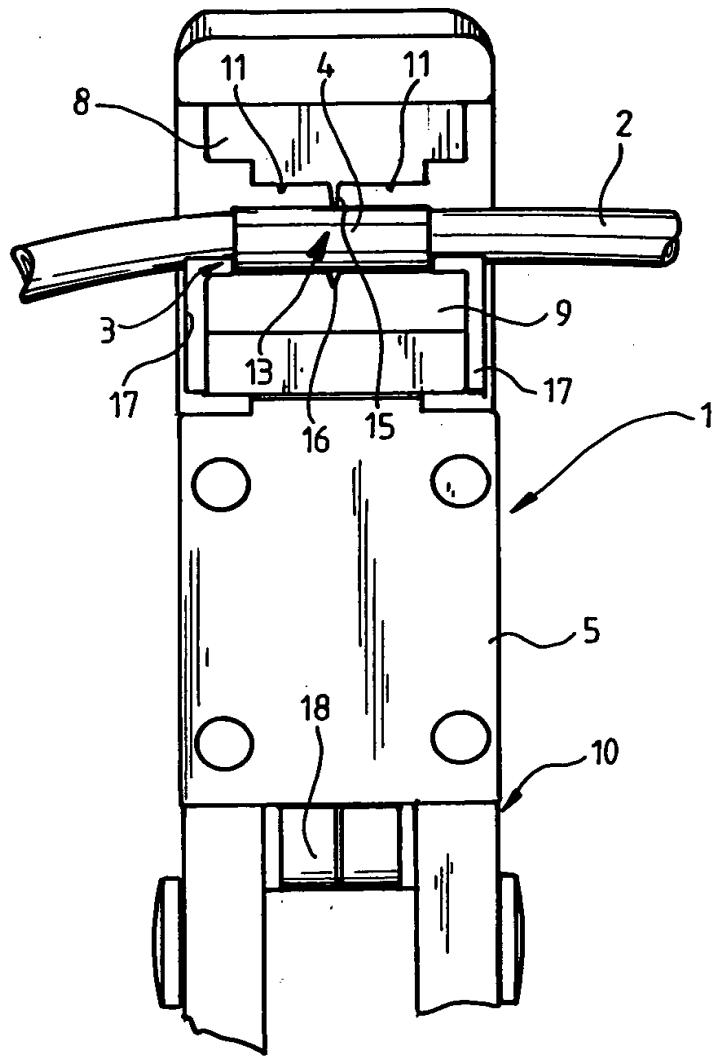


Fig. 2

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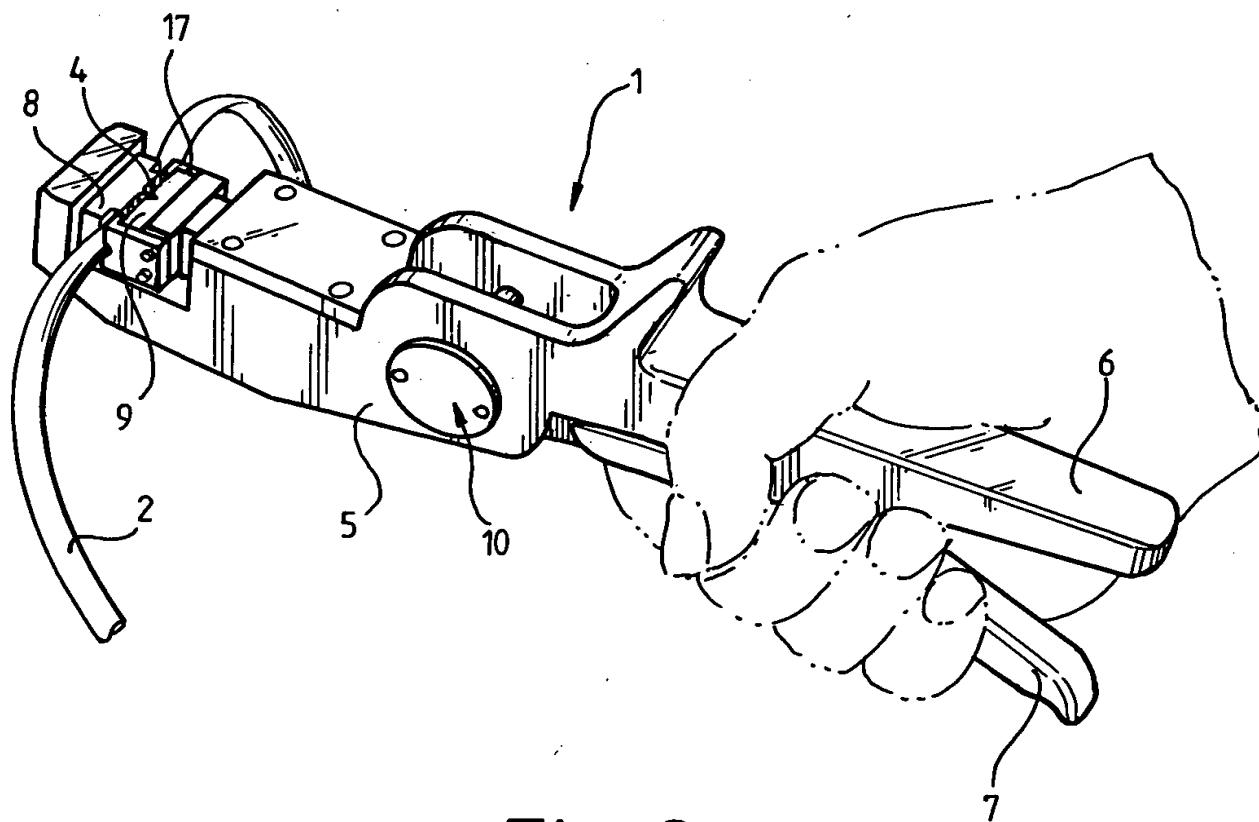


Fig. 3

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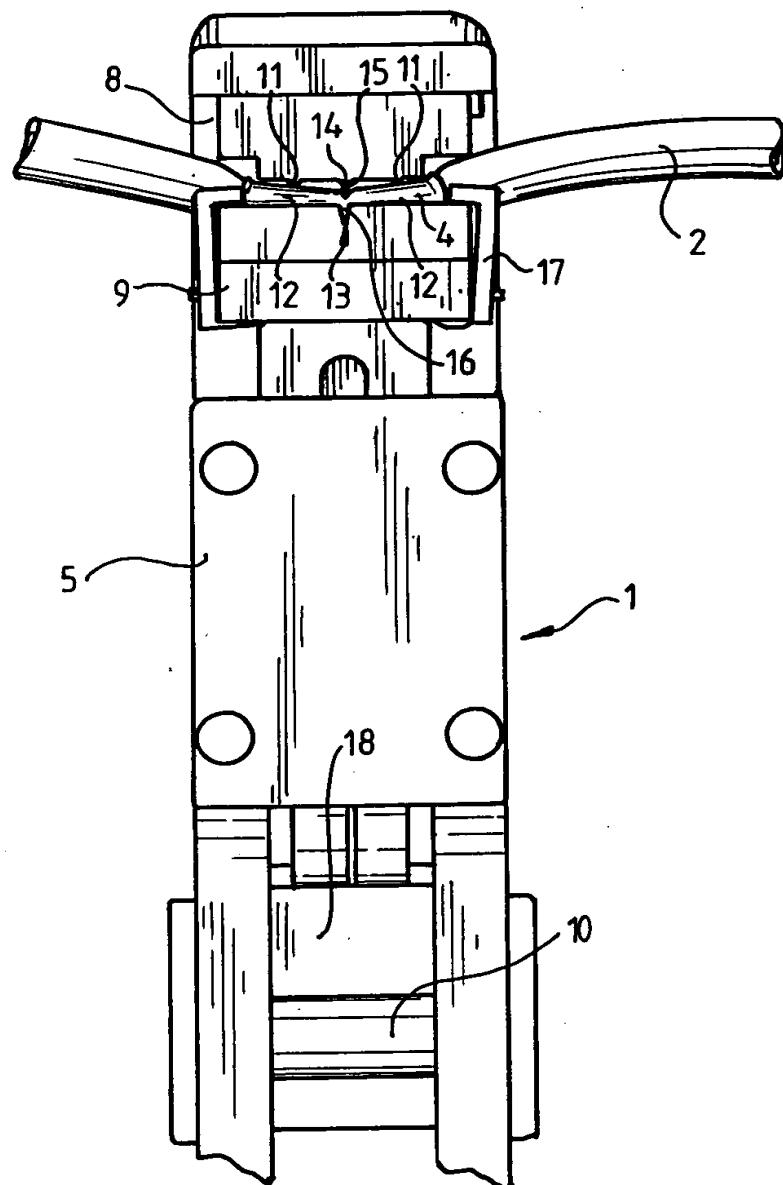


Fig. 4

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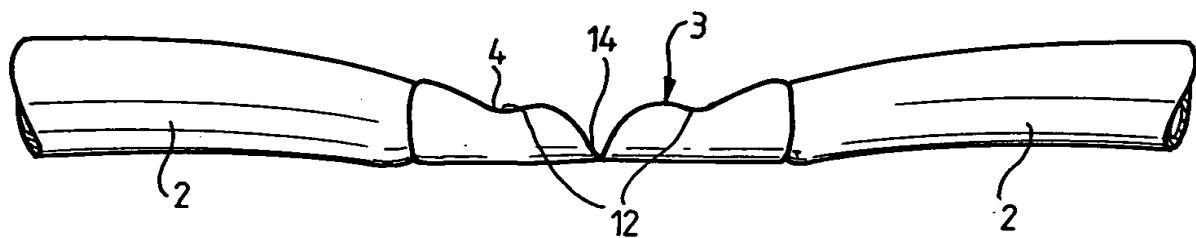


Fig. 5A

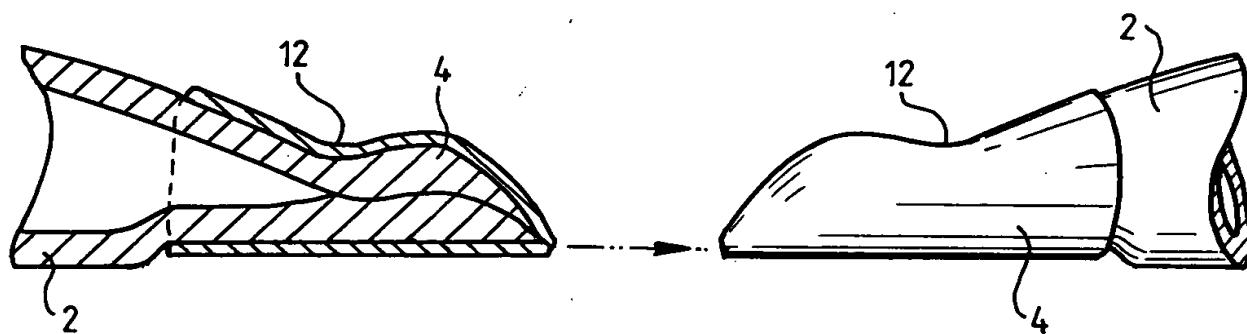


Fig. 5B